

[002] This application is a national stage completion of PCT/EP2003/007214 filed July 5, 2003 which claims priority from German Application Serial No. 102 31 350.4 filed July 11, 2002. ◆◆◆

[003] FIELD OF THE INVENTION ◆◆

[004] ~~According to the preamble of claim 1, t~~ This invention relates to a multi-stage transmission in planetary design, particularly an automatic transmission for a motor vehicle. ◆◆

[005] BACKGROUND OF THE INVENTION ◆◆

[013] ~~This problem is inventively solved by the features of claim 1. Other advantages and advantageous developments result from the sub-claims.~~ ◆◆

[014] SUMMARY OF THE INVENTION ◆◆

[025] BRIEF DESCRIPTION OF THE DRAWINGS ◆◆

[026] ~~The invention is as example will now be described in detail herebelow, by way of example, with reference to the drawings. The accompanying drawings show in which:~~ ◆◆◆

[030] DETAILED DESCRIPTION OF THE INVENTION ◆◆

1-22. (CANCELED)

23. (NEW) A multi-stage transmission in planetary design, particularly an automatic transmission for a motor vehicle, comprising one input shaft (1) and one output shaft (2) located in one housing (G), first, second and third single-web planetary gear sets (P1, P2, P3), at least seven rotatable shafts (1, 2, 3, 4, 5, 6, 7), at least six shifting elements (03, 04, 14, 36, 56, 57), including brakes and clutches, the selective engagement of which produces different reduction ratios between the input shaft (1) and the output shaft (2) so that eight forward gears and two reverse gears can be implemented, input results by one first shaft (1) permanently connected with one element of the planetary gear set (P1), output results via one second shaft (2) permanently connected with a ring gear of the second planetary gear set (P2) and a ring gear of the third planetary gear set (P3), one third shaft (3) is permanently connected with one other element of the first planetary gear set (P1), one fourth shaft (4) is permanently connected with a web of the second planetary gear set (P2) and a web of the third planetary gear set (P3), one fifth shaft (5) is permanently connected with a ring gear of the first planetary gear set (P1), one sixth shaft (6) is permanently connected with a sun gear of the second planetary gear set (P2), one seventh shaft (7) is permanently connected with a sun gear of the third planetary gear set (P3), the third shaft (3) is attachable to the housing (g) by one first brake (03), the fourth shaft (4) is attachable to the housing (G) by one second brake (04), one first clutch (14) detachably interconnects the input shaft (1) and the fourth shaft (4), one second clutch (36) detachably interconnects the third shaft (3) and the sixth shaft (6), one third clutch (56) detachably interconnects the fifth shaft (5) and the sixth shaft (6) and one clutch (57) detachably interconnects the fifth shaft (5) and the seventh shaft (7).

24. (NEW) The multi-stage transmission according to claim 23, the first shaft (1) is permanently connected with a sun gear of the first planetary gear set (P1) and the third shaft (3) is permanently connected with a web of the first planetary gear set (P1).

25. (NEW) The multi-stage transmission according to claim 23, wherein the first shaft (1) is permanently connected with a web of the first planetary gear set (P1) and the third shaft (3) is permanently connected with a sun gear of the first planetary gear set (P1).

26. (NEW) The multi-stage transmission according to claim 23, wherein the first planetary gear set (P1) and the third planetary gear set (P3) are designed as plus planetary gear sets and the second planetary gear set (P2) is designed as minus planetary gear set.

27. (NEW) The multi-stage transmission according to claim 23, wherein the second planetary gear set (P2) and the third planetary gear set (P3) are combined as Ravigneaux planetary gear set with one common web and one common ring gear.

28. (NEW) The multi-stage transmission according to claim 23, wherein additional free wheels can be used in each adequate place.

29. (NEW) The multi-stage transmission according to claim 28, wherein the free wheels are provided between the first, second, third, fourth, fifth, sixth and seventh shafts (1, 2, 3, 4, 5, 6, 7) and the housing (G).

30. (NEW) The multi-stage transmission according to claim 23, wherein input and output are provided on a same side of the housing (G).

31. (NEW) The multi-stage transmission according to claim 23, wherein one or more of one axle and transfer differential is situated on an input side or on an output side.

32. (NEW) The multi-stage transmission according to claim 23, wherein the input shaft (1) can be separated from a prime mover by one clutch element.

33. (NEW) The multi-stage transmission according to claim 32, wherein as clutch element is one of a hydrodynamic converter, a hydraulic clutch, a dry starting clutch, a wet starting clutch, a magnetic powder clutch, or a centrifugal clutch.

34. (NEW) The multi-stage transmission according to claim 23, wherein an external starting element can be located in a flow direction behind the transmission, the input shaft (1) being fixedly connected with a crankshaft of the engine.

35. (NEW) The multi-stage transmission according to claim 23, wherein starting off results by means of one shifting element of the transmission, the input shaft (1) being permanently connected with a crankshaft of the engine.

36. (NEW) The multi-stage transmission according to claim 35, wherein the second brake (04) can be used as a shifting element.

37. (NEW) The multi-stage transmission according to claim 23, wherein one torsional vibration damper can be situated between an engine and the transmission.

38. (NEW) The multi-stage transmission according to claim 23, wherein one wear-free brake can be situated upon each of the at least seven rotatable shafts.

39. (NEW) The multi-stage transmission according to claim 23, wherein a power take-off can be situated upon each of the at least seven rotatable shafts to drive additional units.

40. (NEW) The multi-stage transmission according to claim 39, wherein the power take-off can be situated upon one of the input shaft (1) or the output shaft (2).

41. (NEW) The multi-stage transmission according to claim 23, wherein the at least six shifting elements are designed as one of power shiftable clutches or brakes.

42. (NEW) The multi-stage transmission according to claim 41, wherein the at least six shifting elements are one or more of multi-disc clutches, band brakes and tapered clutches.

43. (NEW) The multi-stage transmission according to claim 23, wherein one or more of form-locking brakes and clutches are provided as the shifting elements.

44. (NEW) The multi-stage transmission according to claim 23, wherein an electric machine can be mounted upon each shaft as one or more of a generator and an additional prime mover.